2017 Rate Determination Field Survey Methodology

Public Workshop – May 1, 2015

CalRecycle

Introduction

Mike Miller - Chief
Division of Recycling
Operations Branch

CalRecycle

Introduction

Michael Vanderburg - Supervisor
Division of Recycling
Rate Determination Section

CalRecycle

Agenda

- Workshop Purpose
- California's Recycling Environment
- 2017 Rate Study Methodology
- Financial Risk Assessment
- Confidence Levels / Error Rates
- Survey Sites / Sample Size / Survey Methodology
- Studies / Research Which May Impact Future Methods
- Questions / Comments / Input / Ideas

CalRecycle

Workshop Purpose

California Beverage Container Recycling & Litter Reduction Act Section: 14549.5

". . . the department shall . . . consult with private and public operators of curbside recycling programs, collection programs, and recycling centers concerning . . . "

CalRecycle

Workshop Purpose

Concerning . . .

- The size of the statewide sample
  - # of containers surveyed
- Appropriate sampling methodologies
  - How samples are acquired and surveys conducted
- Alternatives to exclusive reliance on a statewide commingled rate
  - Is there a better way to pay out monies from the Fund?

CalRecycle

The Recycling Environment in California

CalRecycle

Number of CRV Containers Sold Annually In California

- PET 9.46 billion
- Aluminum 8.35 billion
- Glass 3.04 billion
- HDPE 0.29 billion
- Other 0.22 billion (bi-metal & #3 - #7 plastics)
- Total 21.36 billion

CalRecycle

Annual Value of CRV Material Redeemed

$1.086 billion

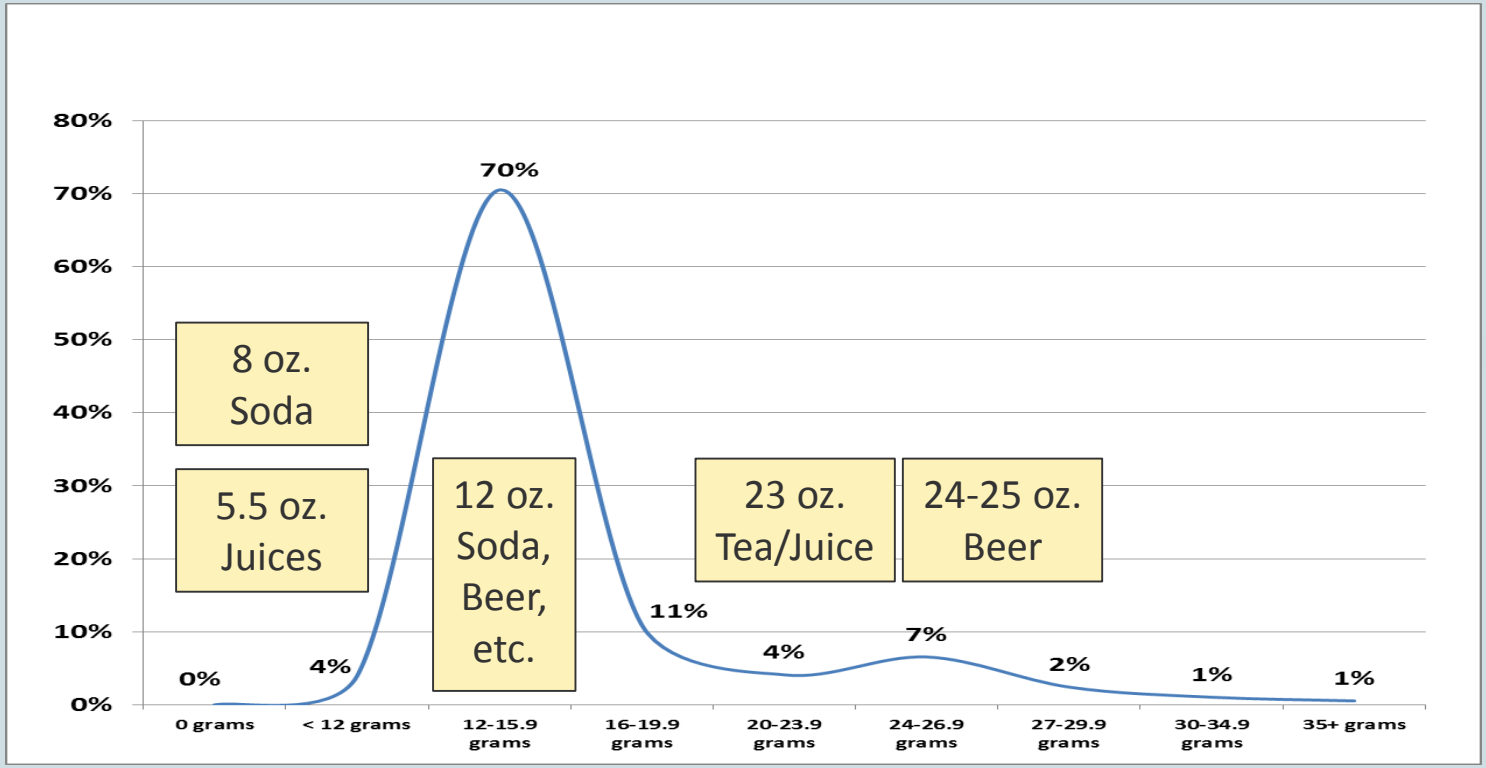
CalRecycle

Variety of CRV Containers Sold In California

- Thousands of brands, products, and types of containers
  - Small containers / Large containers
  - Thin containers / Thick containers
  - Light containers / Heavy containers
  - Long-time well-known products / New “weird” products

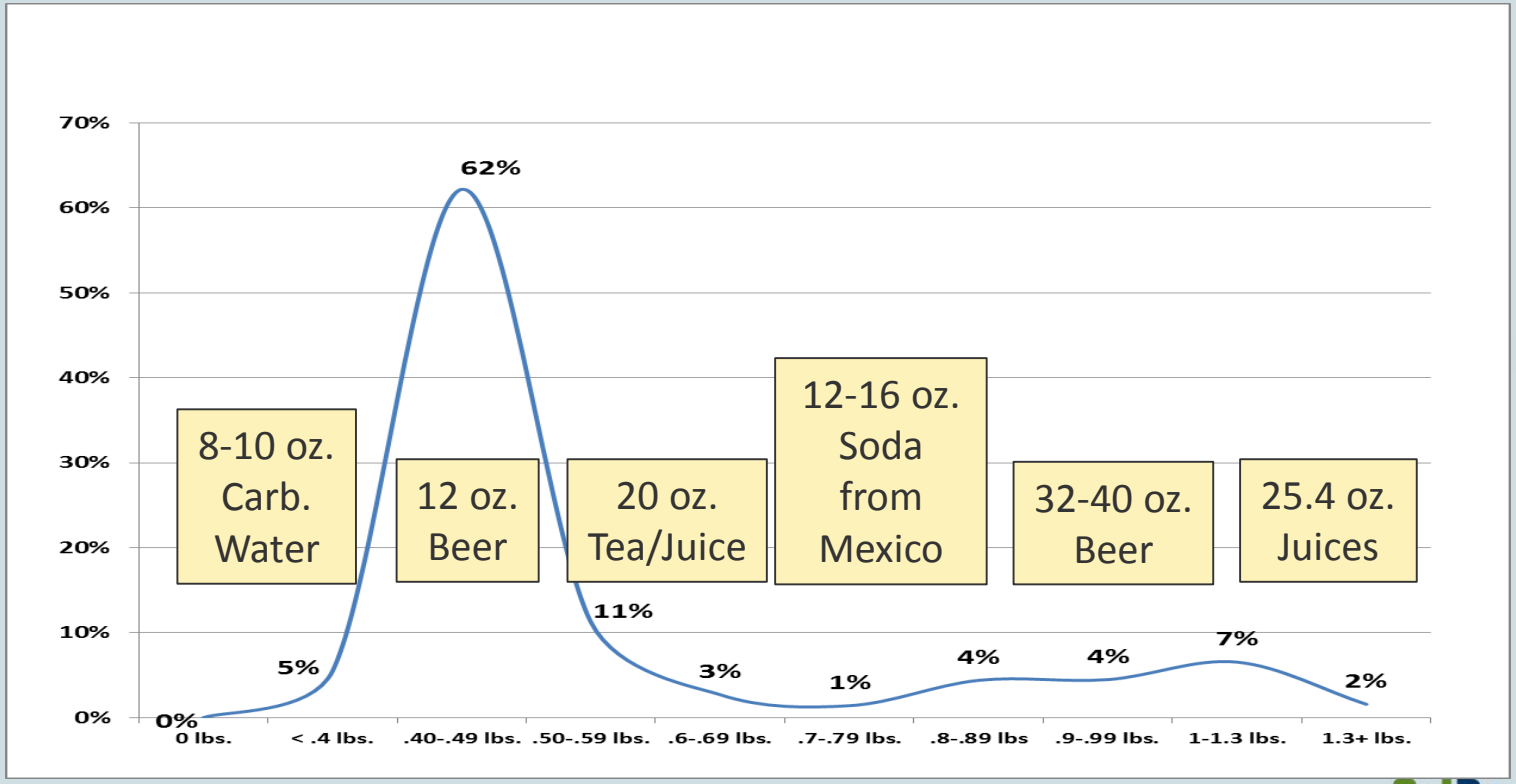
CalRecycle

CRV AL Container Weight Distribution



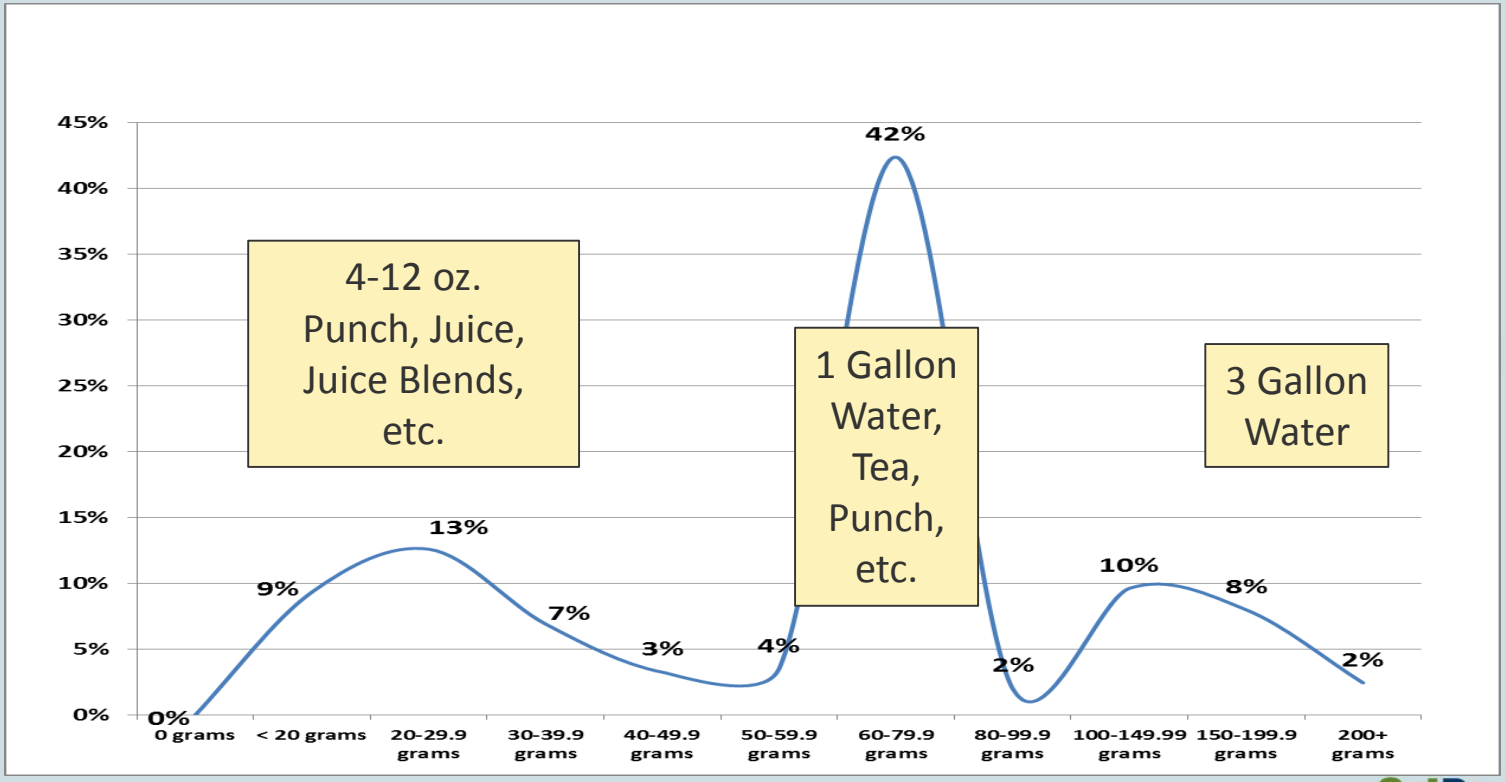
CalRecycle

CRV GL Container Weight Distribution



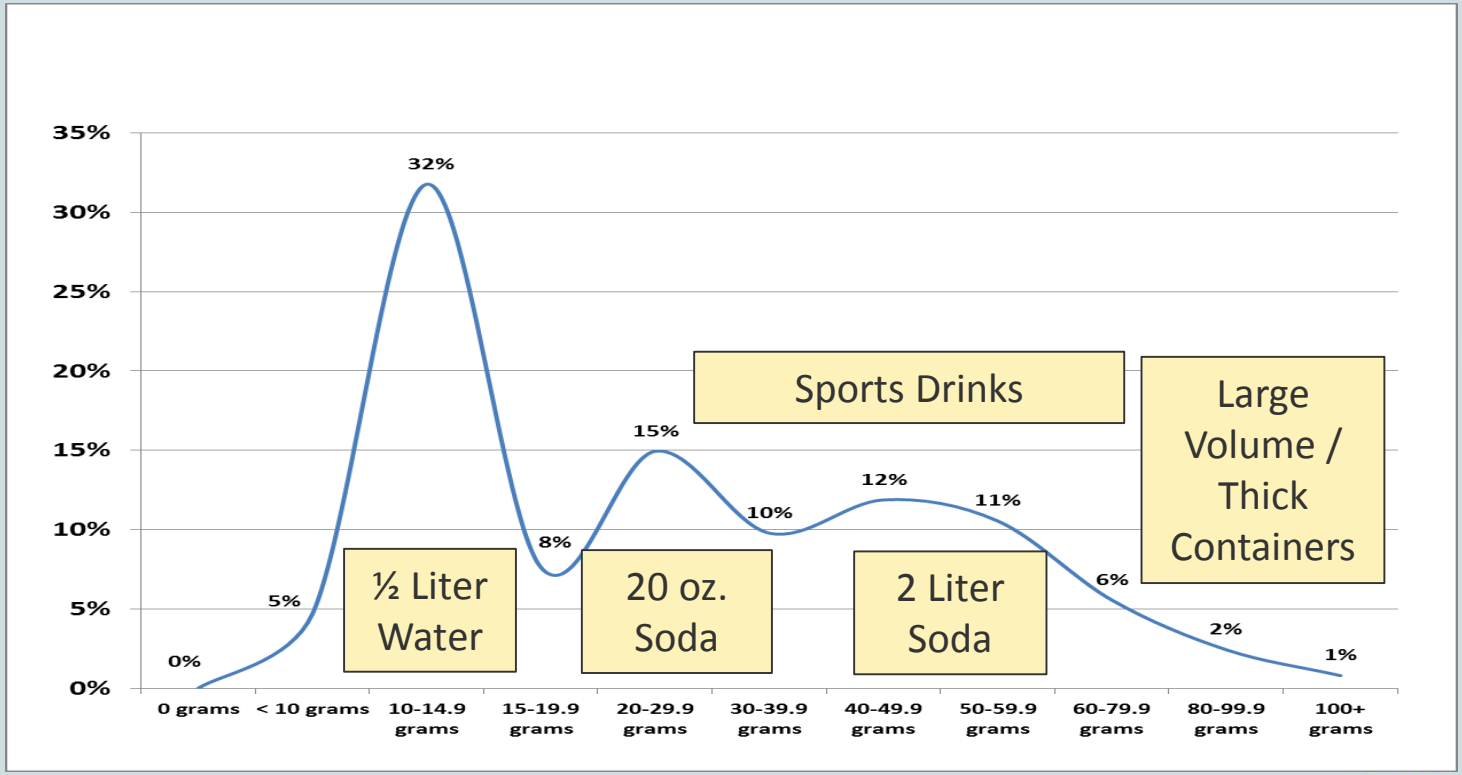
CalRecycle

CRV HDPE Container Weight Distribution



CalRecycle

CRV PET Container Weight Distribution



CalRecycle

How Does Container Value Disparity Impact The Program?

- Consumer Behavior Will Change To Maximize

$$$'s

CalRecycle

How Does Container Value Disparity Impact The Program?

- To get the most money:
  - Consumers will often have lighter containers redeemed by count (i.e.: half-liter water bottles)
  - Consumers will often have heavier containers redeemed by weight (sports drinks, soda, etc.)

CalRecycle

Why Do We Care About Container Variety & Value Disparity?

- It impacts recycling rates
- It impacts the methods needed to achieve accurate and reliable rates
- It monetarily impacts every customer and industry stakeholder who deals with CRV material

CalRecycle

Our Goal

To ensure payment of the most accurate segregated and commingled rates feasible in order to properly compensate consumers and industry, and to protect the solvency and integrity of the California Redemption Value (CRV) Fund.

CalRecycle

2017 Rate Study Methodology

Financial Risk Assessment

- Determine financial risk for each program and material type:
  - Determine the monetary value of each material type for each program type
  - Rank the monetary value from high to low

CalRecycle

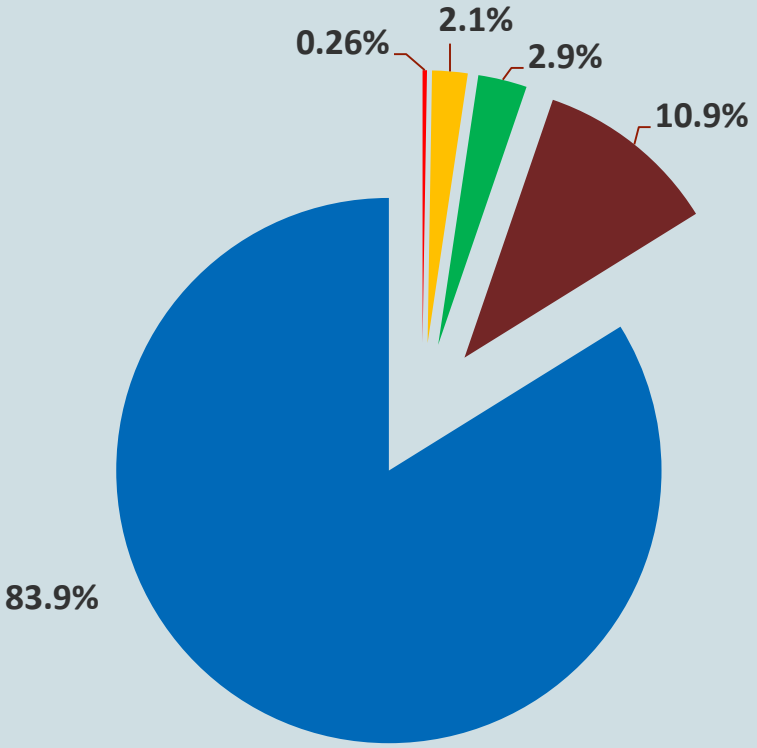
2017 CMRS Risk Assessment – All Programs

- **Annual Value of All Materials Redeemed**

$1.086 billion

CalRecycle

Monetary Value – All Recycling Programs



- Community Service Programs (SP)
- Reverse Vending Machines (RVM)
- Drop-Off / Collection Programs (CP)
- Curbside Programs (CS)
- Recycling Centers (RC)

CalRecycle

Financial Risk Assessment

- Based on the financial risk:
  - Determine confidence levels and error rates for each program and material type
  - Determine the number of containers to sample for each material for each program type
  - Determine the number of sites to survey for each program type

CalRecycle

Sample Size Calculation

- Sample size is adjusted based on:
  - Standard Deviation of container weights
  - Standard Deviation of site survey material
- Based on data from previous studies

CalRecycle

Definition: Confidence Level

A percentage represents how certain the survey results will capture the true parameter.

A confidence level of 95%, means a 95% certainty the survey results will capture the true parameter.

A confidence level of 99%, means a 99% certainty the survey results will capture the true parameter.

CalRecycle

Definition: Error Rate

The “margin of error” is the expectation of survey sample results to vary by a certain amount.

Though it is impossible to sample all containers in a population, results from the sample would be close to, and representative, of the entire population, with a high level of confidence.

CalRecycle

Why Do We Care About Confidence Levels & Error Rates?

- It impacts recycling rates, and the $1 billion CRV Fund
- It monetarily impacts every consumer and industry stakeholder who deals with CRV material
- We all need to have confidence and assurance that the rates are reliable and accurate

CalRecycle

Rate Calculation Goals

<u>Minimum Goal</u>:

95% Confidence Level

5% Error Rate

Most materials are currently surveyed at a

95% Confidence Level with a 2% - 5% Error Rate

CalRecycle

Rate Calculation Goals

<u>For Highest Value Materials</u>:

99% Confidence Level

Less than 3% Error Rates

(RC - Aluminum, Glass, and PET material)

(83% of all redeemed CRV)

CalRecycle

2017 Rate Study Survey Sites

Number of Sites Surveyed for 2017 Rate Year

• Recycling Centers	71 sites	(-1)
• Curbside Programs	39 sites	(+3)
• Drop-Off / Collection Programs	27 sites	(+3)
• Reverse Vending Machines	22 sites	(-2)
• Community Service Programs	16 sites	(+2)
• Total	175 sites	(+5)

CalRecycle

Survey Site Selection

Population Determination:

- **Currently operational programs**
- **Certified at least eight months during prior Fiscal Year**
- **Reported volume to DORiiS during prior Fiscal Year**
- **Not receiving an Individual Commingled Rate (ICR)**

CalRecycle

Site Selection

Sites are grouped by region:

- **Southern California**
  - **Los Angeles, San Diego, Orange, Riverside, San Bernardino, Ventura, Santa Barbara, and Imperial Counties (8 counties)**
- **Northern California**
  - **All other counties (50 counties)**

CalRecycle

Survey Site Selection

- Sites are selected using a random number generator
- Sites are placed in volume strata for each region
- Proportional number of sites are selected from each volume strata

CalRecycle

What is Volume Strata?

Sites are stratified based on received PET volumes

- **Strata #1 Top 50% of volume (high volume)**
- **Strata #2 Next 25% of volume (medium volume)**
- **Strata #3 Lowest 25% of volume (low volume)**

CalRecycle

2017 Rate Study Periods

- 12 month study / Two six-month survey rounds
  - Round #1 - October 1, 2015 to March 31, 2016
  - Round #2 - April 1, 2016 to September 30, 2016
- Same sites surveyed in each six-month round (350 sites)
- The same number of containers are surveyed for each material type at each type of recycling program

CalRecycle

Rate Study Rounds

- Surveys are scheduled every month of the year
- Surveys are scheduled most weeks of the year
- Surveys are distributed evenly over all seasons
  - To reflect “seasonality” (all seasons of the year)

CalRecycle

Materials Sampled

- Recycling Centers (RCs)
  - Aluminum
  - Glass
  - HDPE plastic
  - PET plastic
  - Bi-Metal
  - #3 - #7 plastic resins

CalRecycle

Materials Sampled

- Curbside, Drop-Off / Collection, RVMs, Community Service Programs
    - Aluminum
    - Glass
    - HDPE plastic
    - PET plastic

CalRecycle

2017 Annual Sample Recycling Centers

• Aluminum	=	12,000+	containers
• Glass	=	12,000+	containers
• HDPE	=	10,000+	containers
• PET	=	40,000+	containers
• Bi-Metal	=	2,000+	containers
• #3 - #7 plastics	=	2,000+	containers
		78,000+	

CalRecycle

2017 Annual Sample Curbside Programs

• Aluminum	=	3,000+	containers
• Glass	=	5,000+	containers
• HDPE	=	7,000+	containers
• PET	=	7,000+	containers
		22,000+	

CalRecycle

2017 Annual Sample Collection Programs

• Aluminum	=	2,500+	containers
• Glass	=	3,500+	containers
• HDPE	=	4,500+	containers
• PET	=	4,500+	containers
		15,000+	

CalRecycle

2017 Annual Sample Reverse Vending Machines

• Aluminum	=	3,500+	containers
• Glass	=	3,500+	containers
• HDPE	=	500+	containers
• PET	=	15,000+	containers
		22,500+	

CalRecycle

2017 Annual Sample Community Service Programs

• Aluminum	=	1,300+	containers
• Glass	=	2,200+	containers
• HDPE	=	3,000+	containers
• PET	=	3,000+	containers
		9,500+	

CalRecycle

Containers Surveyed for 2017 Rates

140,000+ containers

(Aluminum, Glass, HDPE, PET, Bi-Metal, and #3 - #7 plastics)

CalRecycle

Survey Sample Selection

- Recycling Centers / RVMs
  - After customer transaction completed
  - Confirm “basis” of purchase from customer
  - Random / unbiased selection
  - Survey whole containers only

CalRecycle

Survey Sample Analysis

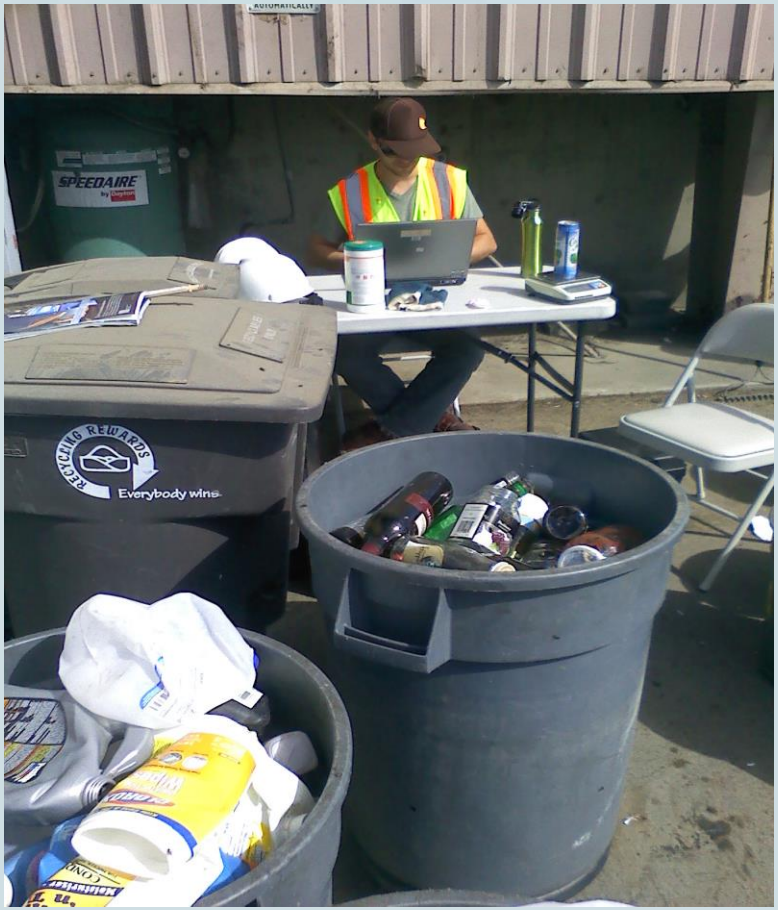
- Containers purchased as a single material type are counted and weighed into batches
  - RC / RVM – as purchased
    - Includes non-CRV and “contaminants”
  - CS / CP / SP – in “market ready” condition
    - Includes non-CRV and “contaminants”
    - To best represent bales reported to CalRecycle

CalRecycle

Survey Sample Analysis

- Container batches are further sorted, counted, weighed, and analyzed
  - CRV less than 24 oz. (5 cents)
  - CRV $\geq$ 24 oz. (10 cents)
  - Product Codes
  - Non-CRV material
  - Contaminants

CalRecycle



Our Mobile Office

CalRecycle

Calculations / Data

- Data from all surveys are combined by program type
  - Containers Per Pound (CPP)
  - Refund Value Per Segregated Pound (RVSP)
  - Refund Value Per Commingled Pound (RVCP)
  - Other data and information
    - Legislation / Regulation
    - CalRecycle Stakeholders
    - Industry Stakeholders

CalRecycle

Calendar for 2017 CMRS Survey

• Organize / Plan	Apr. - Sep. 2015
• Public Workshops	May 1 & Oct. 30, 2015
• First Round Surveys	Oct. 2015 – Mar. 2016
• Second Round Surveys	Apr. 2016 – Sept. 2016
• Public Hearing for 2017 Rates	Late October 2016
• Notice of 2017 Rates	December 1, 2016
• 2017 Rates Effective	January 1, 2017

CalRecycle

Current Studies / Research Which May Impact Future Survey Methods

- Contamination Study
- Impact of Our Presence on Survey Metrics
- Rate Study
  - Day of the Week, Time of the Day, etc.
- Sunday RC Survey Pilot
- Health & Safety Issues
- Rate Format (decimal points)

CalRecycle

Workshop Purpose - Recap

California Beverage Container Recycling & Litter Reduction Act Section: 14549.5

- Size of the statewide sample
  - Is 140,000+ containers a year enough?

CalRecycle

Workshop Purpose - Recap

California Beverage Container Recycling & Litter Reduction Act Section: 14549.5

- Appropriate sampling methodologies
  - Are our current survey and sampling methods adequate?

CalRecycle

Workshop Purpose - Recap

California Beverage Container Recycling & Litter Reduction Act Section: 14549.5

- Alternatives to exclusive reliance on a statewide commingled rate
  - Are there better ways to determine how to pay monies from the Fund to consumers and industry stakeholders?

CalRecycle

We want to hear from you!

CalRecycle

Questions? / Comments? / Input? / Ideas? / Ideas? / Ideas?

Is there other information or data you would like us to share, find, research, etc. for future presentations or publications?

CalRecycle

Thank You!

If you would like further information about our survey methods or rate calculations, please contact:

Mike Miller
Division of Recycling, Operations
Branch Chief
(916) 323-0713
mike.miller@calrecycle.ca.gov

Michael Vanderburg
Division of Recycling, Operations
Rates Determination Section Supervisor
(916) 327-2769
michael.vanderburg@calrecycle.ca.gov

CalRecycle